



REGULATORY GUIDE 4.5

GUIDE FOR THE PREPARATION OF OPERATING AND SAFETY PROCEDURES FOR VETERINARY MEDICINE FACILITIES

I. Introduction

Operating and safety procedures are required by 25 Texas Administrative Code (TAC) §289.227(i)(2). The model procedures in this regulatory guide are generalized. You must write procedures that are specific for your facility. By using the sections of this guide that apply, you may create your unique set of operating and safety procedures. This guide may also be used to develop operating and safety procedures for facilities with mobile services. Although other formats are acceptable, information contained in §289.227(u) must be included in your operating and safety procedures. Individuals who are sole practitioners and sole operators and the only occupationally exposed individual are exempt from §289.227(i)(2) and do not have to maintain operating and safety procedures.

II. Sample Operating and Safety Procedures

OPERATING AND SAFETY PROCEDURES FOR

(name of facility)

This manual establishes procedures that will minimize radiation exposure to employees. They are provided to comply with regulations enforced by the Texas Department of Health, Bureau of Radiation Control (BRC). The regulations require that each x-ray facility be registered with the BRC. The certificate of registration contains conditions and restrictions that apply to the operation of the x-ray machines in this facility as well as a listing of the sections of the regulations that apply. These regulations are available for your review in/at _____ (specify location) [See §289.203(b)].

Regulatory Guides are issued to describe and make available acceptable methods of implementing specific sections of **Title 25 Texas Administrative Code Chapter 289, Texas Regulations for Control of Radiation**, to delineate techniques used by the staff in evaluating specific issues, or to provide guidance to applicants, licensees, or registrants. Regulatory Guides are **NOT** substitutes for regulations and compliance with them is not required. Methods and solutions different from those set out in the guides will be acceptable if they provide a basis for the Texas Department of Health, Bureau of Radiation Control, to make necessary determinations to issue or continue a license or certificate of registration.

Comments and suggestions for improvements in these Regulatory Guides are encouraged at all times and they will be revised, as appropriate, to accommodate comments and to reflect new information or experience. Comments should be sent to the Deputy Director, Standards and Industrial Radiographer Certification, Bureau of Radiation Control, Texas Department of Health, 1100 W. 49th Street, Austin, Texas 78756-3189.

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The regulations require that a Radiation Safety Officer (RSO) be designated. The RSO has the responsibility and authority for assuring safe radiation practices and serves as the contact person between this facility and the BRC. Direct all your questions or concerns on radiation safety to the RSO for this facility, _____ (specify name) [See §289.226(w)(2)].

A. Operator Safety

1. Personnel Monitoring Requirements. [See §289.231(n)(1) and (s)(3)]

Any adult who is likely to receive a dose from occupational exposure to radiation in excess of 500 millirem in a year must use an individual monitoring device such as a film badge or thermoluminescent dosimeter. Declared pregnant women who are likely to receive a dose from occupational exposure to radiation in excess of 50 millirem during the entire pregnancy must also use an individual monitoring device [See §289.231(n)(1)].

- a. Individual monitoring devices must be worn at the unshielded location of the whole body likely to receive the highest exposure. When a protective apron is worn, the location of the individual monitoring device is typically at the neck (collar) [See §289.231(q)(1)(B)].
- b. Additional individual monitoring devices used for monitoring the dose to the embryo/fetus of a declared pregnant woman must be located at the waist under any protective apron being worn by the woman [See §289.231(q)(1)(C)].
- c. The individual monitoring device shall be assigned to and must be worn only by one individual [See §289.231(q)(1)(A)].
- d. When wearing a protective apron during fluoroscopy procedures, multiple individual monitoring devices may be worn. When multiple devices are worn, occupational doses shall be determined in accordance with §289.231(m)(3).
- e. If multiple individual monitoring devices are worn by a declared pregnant woman, dose to the embryo/fetus and the occupational dose to the woman shall be determined in accordance with §289.231(m)(1)(D)(iv).

- f. Individual monitoring devices that are not being worn and the control monitoring device will be stored in an area that is away from rooms where radiation machines are in use. This is in/at (specify location).
- g. (specify name) is responsible for the occupational dose records and exchanging the individual monitoring devices on (specify exchange dates). The individual monitoring device readings (film badge reports) are located in/at (specify posting or records location).
- h. If you are working for another employer and receive an occupational dose, you should report that dose to the RSO so that it can be included in your annual record of occupational dose.

2. Use of Protective Devices

- a. Use protective devices, such as lead aprons, gloves, and shields, to reduce exposure to radiation and keep radiation exposure as low as reasonably achievable (ALARA).
- b. If fluoroscopic procedures are being performed, protective devices (lead drapes, hinged sliding panels) shall be in place. If sterile fields or special procedures prohibit the use of protective devices, all individuals in the fluoroscopic room must wear protective aprons of 0.5 mm lead equivalent [See §289.227(o)(8)].
- c. Protective device(s) is/are stored in/at (specify location).
- d. Protective devices shall be checked annually for defects, such as holes, cracks, or tears. This check can be done by visually inspecting or feeling the protective devices or may also be done by x-raying these items. A record will be kept of this check [See Appendix C]. If a defect is found at the time of the annual check or on any other occasion, notify the RSO and remove the device from service until it can be repaired or replaced [See §289.227(i)(4)(B)].

3. Holding of Animals, X-ray Tubes, and Films

- a. Do not hold the x-ray tube during an exposure [See §289.227(i)(11)].
- b. When an animal must be held in position during the x-ray exam, mechanical supporting or restraining devices shall be used when the procedure permits [See §289.227(i)(8)].
- c. If it becomes necessary for an individual to hold an animal or film

during the x-ray exam, the individual must wear protective devices [See §289.227(i)(8)(B)].

5. Posting Notices, Instructions, and Reports to Workers; and Posting a Radiation Area

- a. Read the "Notice to Employees" sign posted in/at (specify location).
- b. The certificate of registration, operating and safety procedures, and any notices of violations involving radiological working conditions are located in/at (specify location(s)) [See §289.203(b)].
- c. Your rights and obligations as a radiation worker are found in §289.203(c), (d), (e), (f), (g), and (i) of the regulations.
- d. The room(s) in which the x-ray machine(s) is/are located and operated is a radiation area and is restricted [See §289.231(x)].
(Choose one of the following sentences)
 - C The radiation area is designated by "Caution, Radiation Area" signs [See §289.231(x)(1)].
 - C Our facility is not required to post "Caution, Radiation Area" signs because our operators have continuous surveillance and access control to the radiation area [See §289.227(d)(4)].

B. Dose to Operators

1. Occupational dose limits are found in §289.231(m).
2. If any employee is pregnant or becomes pregnant, she may voluntarily inform the RSO in writing of the pregnancy [See §289.231(c)(11)]. If the RSO is informed of the pregnancy, the facility must ensure that the dose to the embryo/fetus does not exceed 0.5 rem (500 mrem) during the entire pregnancy [See §289.231(m)(1)(D)].
3. Radiation Incident or Overexposure

If you suspect there has been an excessive exposure or a radiation incident, immediately notify the RSO.

C. Operation of the X-ray Machine and Film Processing

1. Ordering of X-ray Exams

No x-ray exams shall be taken unless ordered by a licensed veterinarian [See §289.227(b)(1) and (n)(13)].

2. Operator Position During Exposure

During the exposure, the operator must be positioned so that the operator exposure is as low as reasonably achievable (ALARA) and/or protected by a lead apron, gloves, or other shielding [See §289.227(i)(10)].

3. Use of a Technique Chart

Use of a technique chart aides in reducing the exposure to the operator. It must be used for all exposures. Our technique charts are displayed in the vicinity of the control panel of each x-ray machine and may be (choose one or both of the following: written; or electronically displayed) [See §289.227(i)(1)].

4. Restriction and Alignment of the Beam [See §289.227(n)(2) and (3)]

- a. The useful x-ray beam shall be restricted to the area of clinical interest.
- b. Use the beam limiting devices (collimator/cones) provided on the x-ray machine.
- c. The primary beam must be centered with the film. Our method of centering the primary beam is (describe method).

5. Use of Fluoroscopic Machines

- a. Reset the 5-minute cumulative timing device before each fluoroscopic procedure [See §289.227(o)(7)(A)].
- b. For mobile fluoroscopy (i.e. C-arm) units, a 30-centimeter source-to-skin distance (SSD) (spacer) must be used [See §289.227(o)(6)(C)].
- c. A 20 centimeter SSD (spacer) may be used for mobile fluoroscopy during (list procedures). The following precautionary measures must be used when a 20-centimeter spacer is utilized (list measures). Immediately following the procedure, restore the 30-cm spacer [See §289.227(o)(6)(D)].

- d. See Section (II)(A)(2)(b) of these procedures for use of protective devices during fluoroscopy.

6. Use of Mobile or Portable Machines

- Mobile x-ray equipment is mounted on a permanent base with wheels and/or casters for moving while completely assembled.
- Portable x-ray equipment is designed to be hand-carried.

During the exposure the operator:

- (a) must be positioned so that his/her exposure is as low as reasonably achievable (ALARA) [See §289.227(i)(10)] and (n)(6) (e.g. 6 feet or more away), and/or
- (b) must wear lead apron, gloves if necessary, or be protected by other shielding [See §289.227(i)(4)]; and
- (c) should never be in line with the direct beam.

7. Film Processing [See Appendix B]

- a. Unexposed film is stored (describe location and procedures for storage) .
- b. Films shall be developed by the time and temperature recommended by the x-ray film manufacturer. These specifications are posted in/at (specify location) [See §289.227(r)(1)].
 - (i) Check the temperature at the beginning of the work day. Do not process films unless the developer temperature is (specify temperature) . Manual processing temperature should be checked throughout the work day.
 - (ii) For automatic processors, run blank films through the processor at the beginning of the work day.
- c. Expiration dates on film and chemicals should be checked periodically. New film or chemicals should be rotated so the oldest are used first. Do not use films or chemicals after the expiration date.
- d.. Chemicals will be replaced by (specify name) according to the manufacturer's or chemical supplier's recommended interval, which is (specify frequency) , or no longer than every three months [See §289.227(r)(2) and (6)].

- e. Safe light(s) in the film processing/loading area is/are provided under these conditions and should not be changed without authorization from the RSO [See §289.227(r)(4)].

Filter type	_____
Bulb wattage	_____
Distance from work surfaces	_____

- f. If you see light leaks around doors, ceilings, or other openings in the darkroom, notify the RSO [See §289.227(r)(3) and (6)].

8. Alternative Processing Systems

(Users of daylight processing systems, laser processors, self-processing (Polaroid) film units, or other alternative processing systems shall develop procedures following manufacturer's recommendations for image/film processing [See §289.227(s)].)

APPENDIX A

SAMPLE RECORD FOR INSTRUCTION OF INDIVIDUALS IN OPERATING AND SAFETY PROCEDURES FOR:

_____ (name of facility)

These procedures have been made available to each individual who operates the x-ray equipment on the date(s) indicated [See §289.227(i)(2)].

(Signature of RSO)

(Date)

Equipment Operator Statement:

I have read these procedures and agree to abide by them.

(Signature of Equipment Operator)

(Date)

(Signature of Equipment Operator)

(Date)

(Signature of Equipment Operator)

(Date)

(Signature of Equipment Operator)

(Date)

(Signature of Equipment Operator)

(Date)

(Signature of Equipment Operator)

(Date)

APPENDIX B

SAMPLE DARKROOM REQUIREMENTS LOG
FOR CALENDER YEAR _____

Automatic processor (Model #, Serial #) _____

OR

Manual processing _____

Developer temperature _____

Chemicals replaced _____ (manufacturer's or
chemical _____ (initials)(date) _____ (initials)(date)
supplier's recommendations

or every 3 months) _____ (initials)(date) _____ (initials)(date)

Darkroom light leak tests performed _____
(every 6 months) _____ (initials)(date) _____ (initials)(date)

Lighting checked in film processing/loading area:

filter type _____
bulb wattage _____
distance from work surfaces _____

_____ (initials)(date) _____ (initials)(date)

Light leaks or related deficiencies noted _____
_____ (initials)(date)

_____ (initials)(date)

Corrections of light leaks or related deficiencies (or attach service/work orders)

_____ (initials)(date)

_____ (initials)(date)

APPENDIX C

SAMPLE PROTECTIVE DEVICES SURVEY
(LEAD APRONS, GLOVES, THYROID SHIELDS, GONADAL SHIELDS)

[illegible]

